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bucolic readers, and they doubtless serve their purpose: it is, however, a fair question, whether a scientific man has the right to bury his discoveries, or even the confirmatory results of his researches, by giving them only to publications of this character. The wheat may be served up with chaff as provender, if need be; but a portion of the same wheat, judiciously winnowed for presentation in the journals of our learned societies, or in the established periodicals which are widely accessible to scientific men, would doubtless yield a fairer return to science. It is, in short, exasperating to find important facts regarding the structure and the life of domestic animals and cultivated plants published only in the midst of details which are of little interest to any one, except as they may have a remote influence upon possible appropriations by a legislature. We submit, that it is the duty of experimenters, who are obliged to publish in such ephemeral, not to say trashy pages, to present the scientific features of their useful work also in a more worthy manner.

THE account given in our notes, of an engineering work planned in western New York, may serve to convince those cautious legislators who look chiefly for immediate results from the forces which they set in motion, that even so theoretical an affair as a state topographical survey may have direct and practical ends. A large swamp occupies a district that might be valuable agricultural land, and spreads its unhealthy exhalations over the adjoining country. The farmers thereabouts, impatient at the slowness of the outlet-stream in cutting down the rocky barrier that holds up the swamp, ask for state aid to hasten the deepening of the channel. The state surveyor is called to their aid: he examines the ground, and reports that the undertaking is entirely feasible, and that, while thus to discount nature's work will cost somewhat over one hundred thousand dollars, the operation may nevertheless commend itself even to the most careful counter of the cost, for the value of the drained land will be increased over one million dollars.

LETTERS TO THE EDITOR.

The cranial ribs of *Micropterus*.

IN No. 65 of *Science*, Mr. Shufeldt has called attention to a pair of rib-like structures articulating with the 'base of the occiput' in *Micropterus salmoides*. He is apparently inclined to refer them to an occipital vertebra. Sagemehl has lately (in the *Morphologisches Jahrbuch*) advanced a theory to the effect, that, in the occipital region of all teleostean skulls, there are a certain number of vertebrae which are to be compared to the anterior spinal vertebrae of the elasmobranchs, and which have fused more or less completely with the true coalesced occipital vertebrae; i. e., those corresponding to the vagus branches. Without either condemning or supporting this theory, I may point out, that, even though spinal vertebrae should have been taken up into the skull, there is no apparent reason why their ribs should persist. The ribs of teleosts are ossifications of the internal portions of the myocommata, and on the disappearance of these, consequent on the abortion of the segment, one would naturally expect the disappearance of the ribs also.

I have, unfortunately, not been able to examine a black bass osteologically, and therefore cannot speak with any degree of certainty as to the nature of the structures described by Mr. Shufeldt. There is, however, a very possible explanation for them; and that is, that they are portions or rudiments of the suprascapulae. In many fish these are two T-shaped structures, the portion corresponding to the perpendicular limb of the T being, in each, horizontal, and articulating with the lower portion of the occipital region; while one end of the portion corresponding to the transverse limb articulates with the pterotic and epiotic, and the other end with the mesoclavicle. If the perpendicular limb were to ossify separately, or if the transverse limb should become rudimentary, a condition would result, apparently similar to what Mr. Shufeldt describes.

This is, of course, merely a suggestion, thrown out for the purpose of arriving, if possible, at a correct identification of these peculiar structures.

J. PLAYFAIR McMURRICH.

Ontario agricultural college, Guelph, Can.,
May 13.

A singular optical phenomenon.

THE phenomenon described by 'F. J. S.' in *Science*, No. 57, and which I at first thought must have been a binocular phantom image, I now think has been truly explained by Mr. Oliver in No. 63. If so, it is only one of a class, examples of which may be seen on every side. I never pass a picket-fence, with another similar fence beyond, without observing and admiring the broad waves of interference running rapidly in one direction or the other. I never look through two fly-screens, one behind the other, without remarking the tortuous shifting waves of interference, like waves of *watered silk*. A lady's silk veil loosely folded shows the same effect beautifully. Of course, the phenomenon is well known and understood; but I was misled by the fact that 'F. J. S.' described it as in mid-air, and nearer the fly-screen. I suppose it may be imagined at any distance, but is usually referred to the plane of one of the objects.

JOSEPH LeCONTE.

Berkeley, Cal., April 28.

Popular names of California flowers.

A botanist, coming to the Pacific coast, may be surprised at the large number of plants that are generally